Ophthalmic parameters and the presence of clinically significant macular oedema

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Publication date:
2006

Document Version
Publisher's PDF, also known as Version of record

The North Jutland County Diabetic retinopathy Study (NCDRS)
Retinal lesions and their association to clinically significant macular oedema

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Purpose

To explore the influence from retinal lesions on the prevalence of clinically significant macular oedema (CSME) in the present diabetic population.

Methods

This cross-sectional study comprised 656 type 1 diabetic subjects and 328 type 2 diabetic subjects undergoing retinopathy screening in the County of North Jutland, Denmark during the period 1st April 2000 to 30th April 2004. The association between CSME and retinal ophthalmic parameters was explored using logistic regression analysis.
Type 2 diabetic subjects were recruited from larger Aalborg and comprised more than 75% of known type 1 diabetic subjects in this area. Type 2 diabetic subjects were recruited from the entire county of North Jutland due to malregulation and comprised less than 5% of all known type 2 diabetic subjects.

Results

The prevalence of proliferative retinopathy was found relatively low in the present diabetic population (Table 1) and lower than previously reported studies (Fig 1). The prevalence of CSME was found relatively high in the present diabetic population (Table 1) and higher than previously reported (Fig 1).

Table 1
Prevalence in NCDRS of proliferative retinopathy and CSME in type 1 and type 2 diabetes.

	Type 1	Type 2
Proliferative retinopathy	0.8 %	0.3 %
CSME	7.9 %	12.8 %

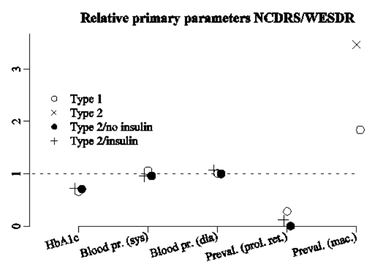

Fig 1
NCDRS and WESDR are compared with respect to HbA1c, blood pressure, prevalence of proliferative retinopathy and CSME. The ratio between medians is depicted, WESCR being reference, i.e. values above one indicates a higher median in the NCDRS.

The prevalence of CSME (Fig 2) and also the number of retinal lesions (Fig 3) revealed a non-linear association to an internationally approved retinopathy scale [1].

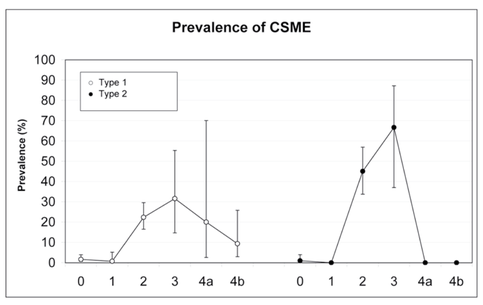

Fig 2
The prevalence of CSME at various retinopathy levels.

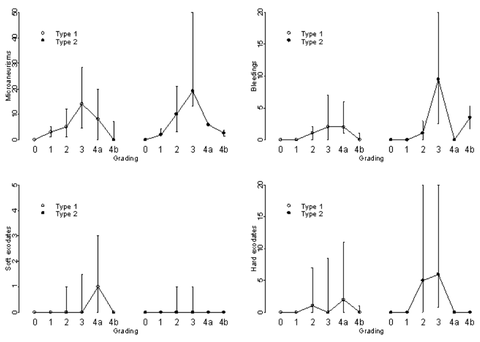

Fig 3
The number of retinal lesions and their association to an internationally approved retinopathy scale.

The prevalence of CSME increased with the number of retinal lesions (Fig 4) and decreased with improved visual acuity (Fig 4).

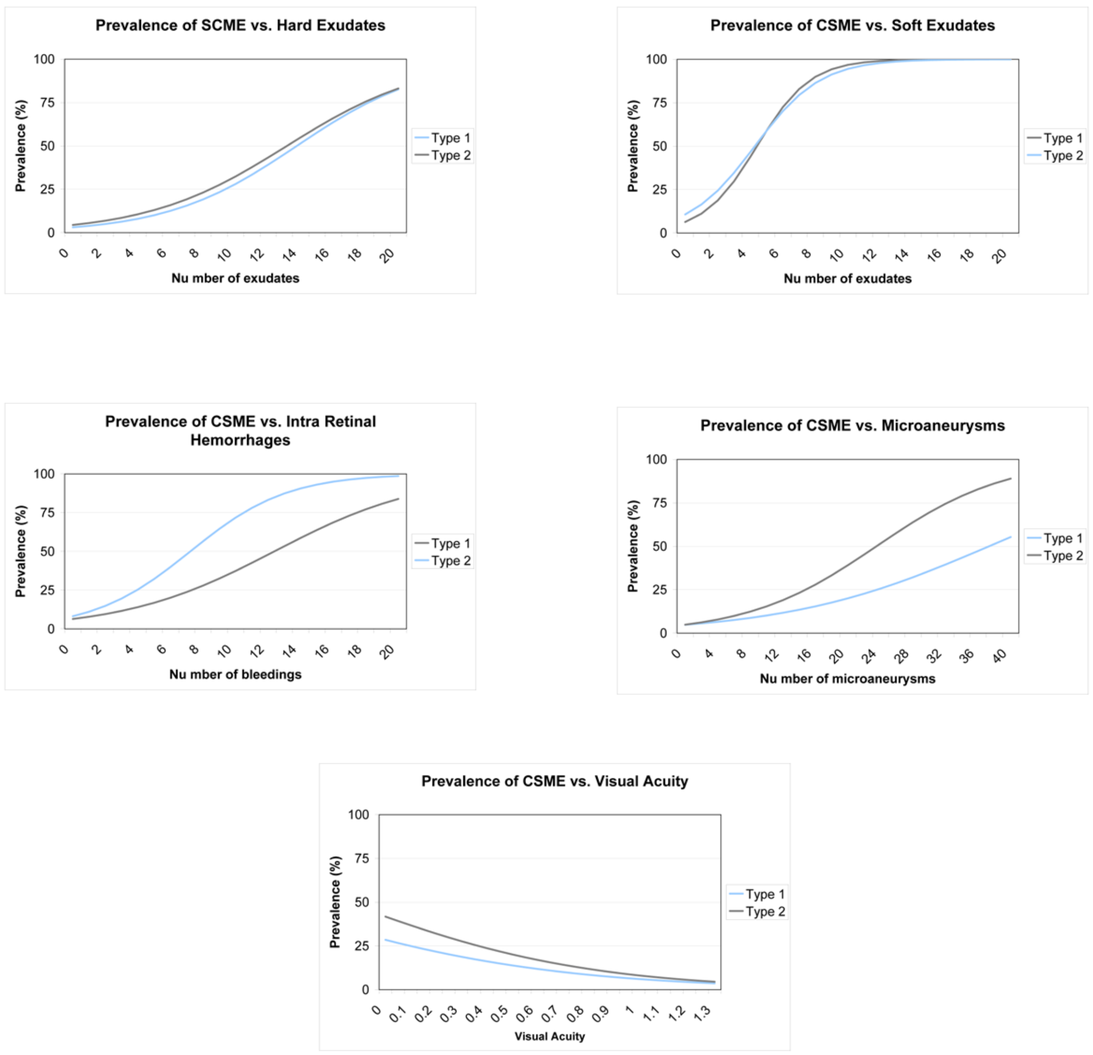

Fig 4

The association between the various retinal lesions and the presence of CSME are illustrated in Fig 2a (type 1 diabetes) and Fig 2b (type 2 diabetes).

Correlations[a]

		Hard exudates	Soft exudates	Intra retinal hemorrhages	Mikroaneurysms	Visual acuity	CSME
Spearman's rho	Hard exudates	1,000	,229**	,350**	,440**	-,104**	,524**
	Soft exudates	,229**	1,000	,462**	,413**	-,098*	,207**
	Intra retinal hemorrhages	,350**	,462**	1,000	,482**	-,176**	,227**
	Mikroaneurysms	,440**	,413**	,482**	1,000	-,110**	,298**
	Visual acuity	-,104**	-,098*	-,176**	-,110**	1,000	-,137**
	CSME	,524**	,207**	,227**	,298**	-,137**	1,000

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
a. dmtype = 1

Table 2a
The association between various retinal lesions and the presence of CSME among type 1 diabetic subjects.

Correlations[a]

		Hard exudates	Soft exudates	Intra retinal hemorrhages	Mikroaneurysms	Visual acuity	CSME
Spearman's rho	Hard exudates	1,000	,265**	,589**	,605**	-,166**	,715**
	Soft exudates	,265**	1,000	,359**	,365**	-,097	,259**
	Intra retinal hemorrhages	,589**	,359**	1,000	,707**	-,228**	,595**
	Mikroaneurysms	,605**	,365**	,707**	1,000	-,193**	,508**
	Visual acuity	-,166**	-,097	-,228**	-,193**	1,000	-,175**
	CSME	,715**	,259**	,595**	,508**	-,175**	1,000

**. Correlation is significant at the 0.01 level (2-tailed).
a. dmtype = 2

Table 2b
The association between various retinal lesions and the presence of CSME among type 2 diabetic subjects.

Conclusions

1. The prevalence of CSME seems increased compared to previous studies.
2. The prevalence of CSME is non-linearly associated to an internationally approved retinopathy scale.
3. The prevalence of CSME increased with the number of retinallesions.

References
1. Wilkinson CP, Ferris FL, Klein R et al (2003). Proposed international clinical diabetic retinopathy and diabetic macular oedema disease severity scale. Ophthalmology 110: 1677-1682.

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